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To: Mr. Jean-Claude Aimé, Executive Secretary
United Nations Compensation Commission

From: Egbert C. Kaltenbach, Deputy Director
and Officer-in-Charge
Audit and Management Consulting Division, OIOS

Subject: <u>Audit of Information Technology Management at the United Nations Compensation Commission (AE97/278/3)</u>

1.   I am pleased to submit to you the final report on the Audit of Information Technology Management at the United Nations Compensation Commission which was conducted in May 1997.

2.   The report's findings and recommendations have been reviewed with United Nations Compensation Commission (UNCC) staff and their comments are included herein. Please include in your response the time schedule for implementation of each accepted recommendation and the recommendation number to facilitate monitoring of their implementation status.

3.   I would appreciate receiving your reply by 28 November 1997.

cc: Mr. J. Connor
Mr. J. P. Halbwachs

AE97/278/3.Rpt

UNITED NATIONS
AUDIT AND MANAGEMENT CONSULTING DIVISION
OFFICE OF INTERNAL OVERSIGHT SERVICES

Assignment No. AE97/278/3   31 October 1997

Audit of Information Technology Management
at the United Nations Compensation Commission

Audit Team:

Auditor-in-Charge:
Daniel J. MacGinley

AUDIT OF INFORMATION TECHNOLOGY MANAGEMENT AT UNCC (AE97/278/3)

Executive Summary

The UNCC Secretariat provides administrative, legal and technical assistance/support for processing claims with the aid of experts in a number of disciplines to facilitate proper claim review. In view of over 2 million claims received, the Governing Council directed that simple, expedited procedures be developed so claims could be resolved in a reasonable period. The Panels of Commissioners determined that a claim-by-claim review would not meet the goal of expediting claims and could result in inconsistent results. They, therefore, adopted procedures for checking individual claims on a sample basis with verification only when warranted. This mass claims process required that claim data be analyzed and standards or "norms" created. Information technology (IT) was used to create claim norms through statistical analysis/regression testing of claim data, use of a claims model and randomization and sampling of actual claims data.

In May 1997, we reviewed how IT was delivered and managed by UNCC's Information Systems Section (ISS) which provides IT solutions and maintains the infrastructure, equipment and software needed to deliver such solutions. The Secretariat's use of IT is complex and innovative, especially in the mass claims process. While the use of IT does expedite the claims process, internal controls and operating procedures need to be strengthened and changes made within ISS to improve the management and control of IT's resources and systems. In particular we recommend that:

- IT plans be developed by ISS and approved by senior management and users;

- ISS strengthen its systems development life cycle methodology, implement steps to retain and document process rules and results, and integrate control, documentation and quality assurance of programs;

- ISS and sections/units develop and carry out plans to integrate claim and payment data, establish data ownership and define secure access to, and update of, such data;

- ISS staff vacancies be filled as quickly as possible;

- ISS be responsible for all IT related activities including contractors or consultants;

- ISS develop and carry out contingency and recovery plans for delivering IT services in the event of hardware/software failures, natural disaster or unlawful activity.

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I. INTRODUCTION

The United Nations Compensation Commission

1.   Following the invasion and occupation of Kuwait by Iraq and the Gulf War, the Security Council, in April 1991, adopted resolution 687 reaffirming Iraq's liability "under international law for any direct loss, damage, including environmental damage and the loss of natural resources, or injury to foreign Governments, nationals and corporations, as a result of Iraq's unlawful invasion and occupation of Kuwait". Subsequently, the Security Council in resolution 692 (1991) established the United Nations Compensation Commission (UNCC) to process claims arising from the invasion and occupation and to administer the Compensation Fund (the "Fund") to pay compensation for claims, and the Commission to administer the Fund.

2.   The functions of the Commission are twofold: first the Commission is responsible for administering the Fund, including the determination of the level of Iraq's contribution to it, and the allocation of funds and payment of claims; and second, the Commission is responsible for developing procedures to resolve claims against Iraq in light of the relevant standards and guidelines. In this respect, the Commission is not a court or arbitral tribunal before which the parties appear; it is a political organ that performs an essential fact-finding function of examining claims, verifying their validity, evaluating losses, assessing payments and resolving disputed claims.

The Governing Council

3.   The Commission functions under the authority of the Security Council and is a subsidiary organ thereof. Its principal organ is the Governing Council, composed of representatives of the current members of the Security Council. The Governing Council is the policy-making organ of the Commission and, as such, has the responsibility for establishing guidelines on all policy matters, in particular, those relating to the administration of the Fund, the organization of the work of the Commission and the procedures to be applied to the processing of claims and to the settlement of disputed claims, as well as to the payments to be made from the Fund.

The Commissioners

4.   The Governing Council is assisted by Commissioners who are experts in fields such as finance, law, accountancy, insurance and environmental damage assessment and who act in their personal capacity. They work in panels of three members to review claims and submit their recommendations to the Governing Council for decision.

The Secretariat

5.   A Secretariat has been established to service the Commission. Under the direction of the Executive Secretary, the Secretariat carries out tasks assigned to it by the Governing Council. In particular, it provides services to the Governing Council and the Commissioners in connection with

processing the claims, developing procedures pursuant to the Governing Council's guidelines for evaluating the claims, and compiling such information as may be mandated by the Rules or requested by the Commissioners to assist them in their review of claims. In addition, the Secretariat provides technical administration of the Fund.

Types and Volume of Claims

6.   Recognizing the diversity of claims that would be filed, the Governing Council categorized claims into six major areas of loss. The following outlines the types of claims submitted as well as approximations of volume:

- 925,000 claims covering departures from Iraq or Kuwait (type "A" claims);

- 6,300 claims for serious personal injury or death (type "B" claims);

- 1,682,000 claims for individual damages up to US$ 100,000 (type "C" claims) including one consolidated claim filed on behalf of 1.24 million Egyptian workers;

- 10,800 claims for individual damages in excess US$ 100,000 (type "D" claims);

- 5,900 claims for business losses (type "E" claims); and,

- 300 claims for losses by organizations and Governments (type "F" claims)

Information Technology/IT at UNCC

7.   The Secretariat, in response to the large volume of claims and the Governing Council's wish toexpedite their processing, appropriately chose to utilize information technology to record, analyze and validate claim data and develop automated processing techniques and procedures to effect payment and settlement of claims. Hardware consists of file servers, workstations, printers and telecommunications equipment linked together in a local area network, under the control of Novell software and a UNIX operating system, while claim and payment data is stored in relational form with database management software from Oracle.

8.   From 5 to 23 May 1997, we conducted a review of how IT was currently being used and managed within the Secretariat by the Information Systems Section (ISS). A draft audit report was submitted to UNCC in August 1997. Management's detailed comments, which confirmed our findings and their agreement with most of our recommendations, are reflected in this final report.

II. AUDIT OBJECTIVES

9.   The audit targeted ISS' planning, organization, control and management of IT services and resources as well as the delivery and alignment of such services with UNCC requirements. The general objectives of the audit were:

(a)   to review current and future UNCC requirements as related to IT, and evaluate the adequacy of ISS' planning activities and their alignment with requirements;

(b)   to evaluate the existing ISS organizational structure as well as the adequacy of internal controls and procedures covering system development and implementation, software quality assurance, database security and safeguarding of data and programs.

(c)   to review the plans, provisions and procedures currently in place to ensure continued UNCC operations in the event of failures in computer hardware or software; and,

(d)   to evaluate ISS performance with respect to IT service delivery.

III. AUDIT SCOPE

10.   The audit focused on UNCC's use of IT and the services provided by ISS. Of prime concern was the manner in which information systems and technology supported the claims and payment processes as well as the adequacy of existing internal control mechanisms and procedures as they related to ISS' delivery of IT solutions for these processes. IT industry standards or "norms" for the development, operational support and maintenance of information systems were used in measuring the adequacy, effectiveness and completeness of IT methodologies, disciplines, procedures and internal control mechanisms of ISS.

IV. OVERALL ASSESSMENT

11.   We found UNCC's use of IT to be complex and innovative, especially with respect to the mass claims process. Although IT is used effectively to expedite the claims process, internal controls and operating procedures need to be strengthened and changes should be made within ISS to improve management and control of IT resources and systems. We have reviewed our findings with management and they agree that improvement is needed. In particular we recommend that:

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- IT plans be developed by ISS and approved by senior management and users (paras. 12-14);

- ISS strengthen its systems development life cycle methodology, implement steps to retain and document process rules and results, and integrate control, documentation and quality assurance of programs (paras. 15-24);

- ISS and sections/units develop and carry out plans to integrate claim and payment data, establish ownership of each data element and define appropriate access to, and update of, such data (para. 25-29);

- noting the new Chief of ISS will assume this position shortly, remaining ISS staff vacancies should be filled as quickly as possible (paras. 30-31);

- ISS be responsible for all IT related activities including those of outside contractors or consultants (paras. 32-33);

- ISS develop and carry out contingency and recovery plans for delivering IT services in the event of hardware/software failures, natural disaster or unlawful activity (paras. 34-38).

V. AUDIT FINDINGS AND RECOMMENDATIONS

A. IT Planning

12.   Planning precedes all other management functions and is, by necessity, the first of the four management functions because from plans flow organization, direction and control. Planning calls for imagination, foresight and thought. It involves participation by senior management (i.e., the Executive Secretary and his Deputies) and heads of units/sections (i.e., administration/finance, claims processing, legal and registry). Because planning is imprecise, plans must be constantly monitored and reappraised in light of actual events and changes which occur within the Secretariat over the life of the plan, and changes in computer technology (i.e., new/enhanced hardware and software) which are commonplace today. The cornerstone of effective IT resource management is an IT plan that meets Secretariat requirements and applies available computer technology in an efficient and timely manner. The IT plan should:

(a)   document Secretariat requirements;

(b)   outline proposed or desired IT solutions;

(c)   quantify needed resources (ie, human, equipment and software) and funding;

(d)   identify other related actions, conditions or prerequisites needed to carry out and complete the plan; and,

(e)   establish a time-table or schedule for plan completion and implementation of solutions.

13.   We found that senior management and heads of units/sections reasonably expected that the efficient and effective use of IT would be planned and coordinated by ISS which has responsibility for providing the Secretariat with appropriate IT solutions. ISS, however, did not have an IT plan in place nor procedures to monitor and improve on-going IT services and address future Secretariat needs or requirements for IT. We also noted that staff was assigned almost exclusively to support the claims process, while virtually no staff was assigned to support the Claims Payment Management System (CPMS) which was becoming increasingly important with implementation of the "oil for food" programme. Notwithstanding current vacancies within ISS, we believe that an IT plan would have revealed the need to address the IT needs of CPMS and the priority of each area's need for ISS resources.

14.   We reviewed these findings with management and they agree that improved IT planning is needed within ISS and UNCC. They also accepted the following recommendation for improving this important and critical process:

We recommend that IT planning be made part of the responsibilities of Chief, ISS including an IT planning mandate that:

(i)   The Chief, at least annually, meet with senior management and heads of sections/units (ie, users) to review current service levels, on-going and planned activities, and areas where IT might enhance efficiency and effectiveness and/or meet changes in the operational or functional requirements of the Secretariat;

(ii)   The Chief revise and/or formulate plans, prepare estimates of needed human and IT resources and funding, and establish preliminary priorities and schedules for delivery of services over the short-term (next 12 months), the medium-term (13-30 months), and long-term (beyond 30 months);

(iii)   Preliminary plans, priorities and schedules be reviewed with, and approved by, senior management and users;

(iv)   At least quarterly, the Chief inform senior management and users of plan status and completion of tasks therein and actions taken or planned so compliance with plan and schedule is maintained; and,

(v)   At least monthly, the Chief monitor and review plan status and delivery schedule with responsible ISS staff and, as appropriate, make adjustments in allotted resources, priorities and/or task assignments in line with completing the plan within schedule. (Recommendation # AE97/278/3/001)

B. Operational Improvements

Reinstitute a complete systems development life cycle methodology

15.   When the need for a new system or modification to an existing one arises, the system development life cycle (SDLC) is a methodology that is commonly used within IT to ensure that quality systems are developed and implemented. The SDLC cycle starts with a perceived need and extends throughout the installation, evaluation, maintenance, and periodic review of the system. Following the steps in the SDLC cycle can be particularly helpful because they can be applied to either the modification or enhancement of existing systems or programs or the development of new systems. Using the SDLC reasonably ensures that the new or revised system meets the organization's needs, is adequately planned, has received appropriate resources, has been properly prioritized within the context of overall requirements, and is implemented according to schedule.

16.   ISS related that they had an eight step SDLC methodology as part of their systems and programming standards and guidelines, which included:

(1)   approval of user request for services;

(2)   ISS analysis and feasibility of the request and evaluation of its impact on currently approved plans, schedules and allocation of ISS resources;

(3)   review of the feasibility/impact by management and, when warranted, approval for ISS to proceed with the request and preparation of a general system design;

(4)   review of the general system design with the user (i.e., requester) and confirmation from them that the new system (or change to an existing system) meets their expectations and requirements;

(5)   detail design and construction of the system by ISS according to their systems and programming standards and guidelines;

(6)   joint ISS and user testing of the new system and, if required, development and completion of data conversion;

(7)   user acceptance of the new or changed system; and,

(8)   turnover of the new system into the production or "live" environment with on-going maintenance and support of the new system provided by ISS.

17.   Management indicated, however, that only the last four steps of the SDLC are currently being followed due to ISS' critical shortage of staff. They also indicated that ISS' shortage of staff, rather than omission of the first four steps of the SDLC, was the reason that resources were not allocated to the claims payment area. We note the difficulties that management faced as a result of a shortage of staff but do not concur that implementation of an abbreviated SDLC was an appropriate remedy. We believe that had ISS followed the full SDLC, management, users and ISS would have been more aware of the contention for ISS resources that existed within the Secretariat, and could have allocated ISS' resources based on the Secretariat's overall requirements and priorities.

> We recommend that ISS reinstitute its eight step SDLC methodology and develop/implement procedures to ensure that all steps are followed and completed before a system is considered complete and moved into the production environment. (Recommendation # AE97/278/3/002)

Implement steps to retain Claims and Payment process results

18.   We note that claim payment data and CPMS programs relating to the first installment of "C" claims had not been retained by ISS. We believe that once a substantial number of claimant's receive awards from the Fund, it is conceivable that grievances and allegations of incorrect processing on the part of the Secretariat will arise from claimants contesting the accuracy and computation of award amounts. We also note the significant gap that will occur between the time the Governing Council approves a claim installment and when the actual payment is made. Recognizing that this delay could span several years and that questions regarding the claim process will be inevitable, provisions should be made to safeguard and retain processing results (i.e., data outputs, reports and programs) of each step of the claim and payment process. We do not believe, however, that each step's process results need to be retained if such processing can be recreated via reprocessing with retained programs and data.

19.   We reviewed and discussed the above findings with management who agree that improvement is needed and concur with the following recommendation:

> We recommend that ISS and each claim processing unit jointly determine the data and programs which should be retained to recreate the processing of each claim installment and payment, noting that the objective of this exercise is to create and maintain the capability to recreate any or all of the steps which occurred in the processing, approval and payment of each claim installment. (Recommendation # AE97/278/3/003)

Create and maintain documentation of the Claims and Payment processes

20.   The claims and payment process is complex and governed by numerous rules and decisions set down by the Governing Council as well as processing assumptions and considerations applied by claims processing units. We note that many staff have been with the Secretariat since its beginning in 1991 (or shortly thereafter) and have a reasonable recollection of the events, decisions and process steps that transpired with each claim installment and payment. This recall of history, events and processes (i.e., institutional memory), however, should not rest solely in the memories of staff. Written documentation relating to the events, decisions, processes, procedures and methodologies of each claim installment and payment must be prepared, maintained and available for reference. Documentation outlining the basis, program specifications and procedures used in each process step of the various claim installments is needed. Without such documentation, definitive answers relating to the past will not be forthcoming, accurate or readily available as time evolves.

21.   We reviewed and discussed the above findings with management who agree with our recommendation:

> We recommend that ISS, in conjunction with the sections/units concerned, prepare written documentation outlining the rules, procedures and program logic of each claim and payment process. This documentation should be clear and concise, outlining the purpose and process of each step and providing an overall understanding of how these steps interrelate to each other and the entire installment and payment process. (Recommendation # AE97/278/3/004)

Controlling changes to programs

22.   When a change to a program is needed, ISS uses a commonly accepted IT methodology of copying the existing production program into a test library, effecting the change to the program, and copying the revised program from the test library into the production environment. ISS uses a software product called "Team Windows" to automate and control this process. The Team Windows product maintains control over the production program library by limiting who can "check-out" programs (i.e., copy to the test library) or "check-in" programs (i.e., copy to the production library). We found that the security features of Team Windows validly limited the check-out or check-in capability to authorized staff. We also found, however, that Team Windows was not integrated with ISS' SDLC methodology nor its systems and programming standards and guidelines to ensure that check-in only occurred after successful completion of the SDLC and conformity with standards and guidelines. Use of the SDLC and standards/guidelines is an acceptable method to ensure that quality is built into new or changed programs and systems. By integrating these quality measures into the check-in phase of Team Windows, ISS can be reasonably confident that all new or revised programs and systems conform to its methodologies and standards for quality.

> We therefore recommend that ISS integrate its use of Team Windows, systems and programming standards/guidelines, and SDLC methodology to ensure that program "check-in" can only occur after the SDLC has been completed and standards and guidelines have been met. (Recommendation # AE97/278/3/005)

Improve the way systems and programs are documented

23.   Program documentation should inform and communicate both in technical and general form (i.e., to be understood by a non-programmer) the program's purpose, inputs and outputs, process logic and the rules governing the edit, validation and/or manipulation of data. We noted that program documentation is currently stored (or imbedded) within program source code (i.e., the instructions prepared by the programmer) as program comments. While maintaining documentation within the program is helpful to the programmer, it does not provide non-programmers with a readily available and useable means to review and/or reference information relating to the program. ISS indicated that although standards for program documentation (outside of what is imbedded in the program) are defined in their systems and programming standards, it has been neglected due to ISS' limited resources and pressures to produce applications and maintain systems.

24.   We reviewed and discussed our findings with management and they agree that improvement in system and program documentation is needed and concur with the following recommendation:

We recommend that:

(i)   ISS reinstitute the requirement that all new or changed programs be documented, consistent with their systems and programming guidelines and standards; and,

(ii)   ISS, over the next 12 - 18 months, document existing production programs in conformity with such guidelines and standards. (Recommendation # AE97/278/3/006)

C. ISS Services and Staffing

The Claim Payment and Management System

25.   The approval and implementation of the oil for food program in 1996 and its formula for providing funds for the payment of claims required the Secretariat, for the first time, to focus on claim payment methodologies and modalities. Recognizing that the underlying data for each Governing Council's approved claim installment resided in the Claims Database, the Secretariat properly chose to design and develop a system for payment of claims that would rely on, and integrate with the already existing Database. ISS, however, did not have the adequate systems and programming resources to both design and construct an appropriate IT solution due to staff vacancies and the higher priority given to the claims process. ISS was, however, able to create a preliminary system design based on requirements provided by the Claim Payment and Support Services (CPSS) unit. The preliminary design was then used by an outside consultant as the basis for detail design and construction of a Claims Payment and Management System (CPMS).

26.   CPMS was constructed by the consultant independent of ISS guidelines and standards for systems and programming. When it was delivered, it did not undergo a quality assurance review by ISS to ensure that its construction was consistent with guidelines and standards, nor did it undergo a functionality/performance review by the CPSS unit to ensure that CPMS delivered the functions and performance that were expected at the time of its design. We noted that CPMS did not conform to ISS' systems and programming standards and guidelines. We also noted that the CPSS unit had commenced functional and performance reviews of CPMS earlier this year but had little success due to the lack of available ISS resources needed to bring CPMS up to, and consistent with, ISS' systems and programming standards and guidelines.

27.   We reviewed and discussed the status of CPMS with management. They related that work has begun to address CPMS' deficiencies and they concur with the following recommendation:

We recommend that:

(i)   Management assign ISS staff to immediately evaluate the status of CPMS and develop a plan to correct, modify and/or reconstruct CPMS so that it meets the Secretariat's functional requirements and conforms with ISS systems and programming standards and guidelines; and,

(ii)   Management delegate to ISS, authority to coordinate with the procurement or personnel office concerned in selecting outside consultants or contractors and to monitor vendor performance to resolve or correct CPMS deficiencies. As an alternative, ISS could engage outside consultants/contractors to support current work assignments thereby allowing ISS staff to work on CPMS.
(Recommendation # AE97/278/3/007)

Integrate the Claims Database and CPMS

28.   Consistent with internal controls, the Secretariat established a separation between the processing of a claim and its payment. The legal and claims processing units have responsibility to process claims with the help of ISS who perform actual data manipulation and program execution based on instructions received from these units. Currently, however, once a claim installment has been approved for payment by the Governing Council, ownership of the claim and its associated data is transferred from these units to the CPSS unit by physically replicating or copying the data from the Claims Database into the CPMS, thereby creating the situation where data is stored in two databases. This approach is contrary to the concept of data integration. Separating claim and payment data does not preclude a single repository of claims and payment data. While we recognize that there is a functional segregation between claim process and payment, we do not believe that this requires physical data separation and storage. The Oracle database management software currently used by the Secretariat can provide logical separation (i.e., ownership) of data between legal/claims process units and CPSS without physically separating data. We believe that the Oracle database management product can satisfy the segregation of duties component of internal controls without compromising the concept of homogeneous and integrated data stored in a single data repository. We find that the responsibilities of each section/unit need to be clearly defined with respect to the Secretariat's overall responsibility for claims process and payment. We also find, with respect to the ownership and security of claims and payment data residing in the database, that provisions for database access and update must be established in a fashion that is consistent with each unit/section's processing responsibilities.

29.   We reviewed and discussed our findings with management who agreed that the Claims Database and CPMS should be integrated. They also indicated that integration work has begun and concur with the following recommendation:

We recommend that:

(i)   Management clearly define and document the duties and responsibilities of each section/unit within the Secretariat with respect to the processing and payment of claims and, notwithstanding the need for segregation of duties, the responsibilities, modalities, procedures and actions of each unit/section should blend and complement so that the Secretariat's collective responsibility for claims process and payment is carried out efficiently and effectively; and.

(ii)   After completing the above, ISS' and section/unit heads should establish secure access to the integrated data within the Oracle software and establish procedures for the timely maintenance of such data. (Recommendation # AE97/278/3/008)

ISS staffing vacancies

30.   Currently, over 50% of ISS' budgeted posts are vacant including the critical and important Chief, ISS post. This position must be filled as rapidly as possible. At the time of our visit, steps were underway to fill this post. Without a Chief, ISS relevance will diminish, staff will become more frustrated, organizational lines of reporting will be ineffective, confidence in ISS will decline, the jurisdictional and political debate of data/systems ownership between claims process and payment will continue, and, the potential to use outside contractors for IT assignments in an unplanned and uncoordinated way will proceed unabated.

31.   Management agreed that ISS staff vacancies must be filled as soon as possible including the critical Chief, ISS position. They also informed us that a new Chief, ISS will report for duty 13 October 1997. They also agree with the following recommendation:

We recommend that ISS fill its staff vacancies as quickly as possible. (Recommendation # AE97/278/3/009)

Responsibility for developing and maintaining systems

32.   As noted previously, CPMS was constructed by an outside consultant not under direct control of ISS, and resulted in the delivery of CPMS that did not meet or conform to ISS' systems and programming standards and guidelines. We believe that ISS must be responsible for the development and maintenance of all IT systems and solutions including those which are developed by outside consultants or contractors, and must provide all units/sections within the Secretariat with services according to the priorities and resources provided by senior management. If, and when, outside consultants or contractors are needed to supplement ISS staff, its Chief should be responsible for their selection and performance.

33.   We reviewed and discussed our findings with management who also share our view that all IT related activities should be under the Chief, ISS. They also concur with the following recommendation:

> We recommend that the Chief, ISS be involved in the selection of outside IT consultants or contractors and monitor their performance. (Recommendation # AE97/278/3/010)

D. Contingency and Recovery Planning

Failures in computer equipment

34.   The Secretariat relies on computer equipment and software to store and process claims and payments. We noted that ISS has taken reasonable steps to ensure that claims/payment processing is not unduly jeopardized in the event of equipment failure. Sufficient back-up equipment was in place to eliminate the risk that failure of single piece of equipment could close down the system. We also noted that plans to improve disk reliability and back-up by installing high speed disk equipment and optical communications links were pending management's approval at the time of our visit. While we agree that this is an important and timely upgrade, we believe final decision should be deferred until it has been reviewed by the new Chief, ISS.

Contingency Plans

35.   We noted that the Secretariat does not have a contingency plan in place in the event that the ISS' computer system was unavailable for reasons other than equipment failure. Natural disasters (i.e., fire, flood, earthquake, etc.), terrorist activity or acts of violence occur rarely but with devastating effect. The objective of contingency planning is to have in place a strategy and action plan to resume

UNCC operations including those of the computer centre within a reasonable and acceptable period of time after a catastrophic event.

36.   We reviewed and discussed our findings with management who have already begun to address this area of concern.   They agree that improvement is needed and concur with the following recommendation:

> We recommend that ISS develop contingency and recovery plans that are specific to computer operations/support and address:
>
> (i)   How ISS and users would respond to a disaster;
>
> (ii)   The steps that both ISS and users would have to carry out in the event computer processing had to be performed at an alternate computer facility; and,
>
> (iii)   The steps that ISS and users would have to carry out when migration back to a new and/or restored computer facility was possible.   (Recommendation # AE97/278/3/011)

37.   The development of an overall contingency plan for UNCC should not be the responsibility of ISS alone, because the primary objective of such a plan is to accommodate UNCC needs by recovering operations in the event disaster strikes.   We believe that the best approach for addressing the recovery needs of UNCC is to develop several related plans and procedures including the ISS plan outlined above that, when consolidated, form a comprehensive contingency plan.   ISS users must assess the impact of an interruption or loss of ISS computer services and support due to a disaster.

38.   We reviewed and discussed our findings with management and they share our concern.   They have agreed that improvement in this area is needed and concur with the following recommendation:

> We recommend that ISS and users assess the impact that loss of the computer facility would have on their on-going activities and develop appropriate contingency/recovery plans and procedures in the event that continued operation of their facility was not viable or possible. (Recommendation # AE97/278/3/012)

VI. ACKNOWLEDGEMENT

39.   We wish to express our appreciation for the assistance and cooperation extended to the auditor(s) by the management and staff of UNCC.

/~Egbert C. Kaltenbach
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